

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :
Makoto AKIZUKI et al. :
Serial No. [NEW] : **Attn: APPLICATION BRANCH**
Filed December 26, 2001 : Attorney Docket No. 2000-1897

METHOD FOR FORMING GAS CLUSTER
AND METHOD FOR FORMING THIN FILM

(Rule 1.53(b) Continuation of Serial
No. 09/799,681, Filed March 7, 2001)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Please amend the present application as follows:

IN THE SPECIFICATION:

Please replace the paragraph beginning immediately after the title with the following rewritten paragraph:

--This is a Rule 1.53(b) Continuation application of Serial No. 09/799,681, filed March 7, 2001, now abandoned, which is a continuation of Serial No. 09/566,740, filed May 9, 2000, now abandoned, which is a continuation of Serial No. 08/951,959, filed October 17, 1997, now abandoned which is a continuation of Serial No. 08/650,905, filed May 17, 1996, now abandoned.--

IN THE CLAIMS:

Please amend claims 3 to 7, 9, 13, 14 and 17 as follows:

3. **(Amended)** A method as claimed in claim 1, wherein said substance liquid at the room temperature under the atmospheric pressure is an organic metal compound.

4. **(Amended)** A method as claimed in claim 1, wherein said substance liquid at the room temperature under the atmospheric pressure is $\text{Ti}(\text{i} - \text{OC}_3\text{H}_7)_4$.

5. **(Amended)** A method as claimed in claim 1, wherein said pressurized gas is an inert gas or a reactive gas.

6. **(Amended)** A method as claimed in claim 1, wherein said nozzle is an expansion-type nozzle.

7. **(Amended)** A method for forming gas cluster ions, which comprises the step of ionizing the gas cluster formed by the method as claimed in claim 1.

9. **(Amended)** A method for forming a thin film, which comprises the step of irradiating the cluster ions formed by the method as claimed in claim 7 onto a substrate surface, thereby forming a thin film.

13. **(Amended)** A method for forming a thin film as claimed in claim 11, wherein an oxide film is deposited by irradiating cluster ions of a gas containing oxygen and at least an organic metal compound gas onto the substrate surface.

14. **(Amended)** A method for forming a thin film as claimed in claim 11, which comprises the steps of irradiating oxygen gas cluster ions onto the substrate, and at the same time, or alternately, irradiating a single, or a plurality of, component gas of deposit film onto the substrate surface to cause reaction of the both, thereby depositing a thin ferroelectric film on the substrate surface.


17. **(Amended)** A method for forming an oxygen-containing gas cluster, which comprises the step of ionizing the gas cluster formed by the method as claimed in claim 15.

REMARKS

The above Amendment provides updated continuation information at the top of the specification and also eliminates multiple dependent claims, including improper multiple dependent claims.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Page 1, the paragraph beginning immediately after the title has been amended as follows:

This is a Rule 1.53(b) Continuation application of Serial No. 09/799,681, filed March 7, 2001, now abandoned, which is a continuation of Serial No. 09/566,740, filed May 9, 2000, now abandoned, which is a continuation of Serial No. 08/951,959, filed October 17, 1997, now abandoned which is a continuation of Serial No. 08/650,905, filed May 17, 1996, now abandoned.

IN THE CLAIMS:

Claims 3 to 7, 9, 13, 14 and 17 have been amended as follows:

3. (Amended) A method as claimed in claim 1 [or 2], wherein said substance liquid at the room temperature under the atmospheric pressure is an organic metal compound.

4. (Amended) A method as claimed in [any one of claims] claim 1 [to 3], wherein said substance liquid at the room temperature under the atmospheric pressure is $\text{Ti}(\text{i} - \text{OC}_3\text{H}_7)_4$.

5. (Amended) A method as claimed in [any one of claims] claim 1 [to 4], wherein said pressurized gas is an inert gas or a reactive gas.

6. (Amended) A method as claimed in [any one of claims] claim 1 [to 5], wherein said nozzle is an expansion-type nozzle.

7. (Amended) A method for forming gas cluster ions, which comprises the step of ionizing the gas cluster formed by the method as claimed in [any one of claims] claim 1 [to 6].

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9. (Amended) A method for forming a thin film, which comprises the step of irradiating the cluster ions formed by the method as claimed in claim 7 [or 8] onto a substrate surface, thereby forming a thin film.

13. (Amended) A method for forming a thin film [a] as claimed in claim 11 [or 12], wherein an oxide film is deposited by irradiating cluster ions of a gas containing oxygen and at least an organic metal compound gas onto the substrate surface.

14. (Amended) A method for forming a thin film as claimed in [any one of claims] claim 11 [to 13], which comprises the steps of irradiating oxygen gas cluster ions onto the substrate, and at the same time, or alternately, irradiating a single, or a plurality of, component gas of deposit film onto the substrate surface to cause reaction of the both, thereby depositing a thin ferroelectric film on the substrate surface.

17. (Amended) A method for forming an oxygen-containing gas cluster, which comprises the step of ionizing the gas cluster formed by the method as claimed in claim 15 [or 16].